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HEDGES FOR THE PRAIRIES



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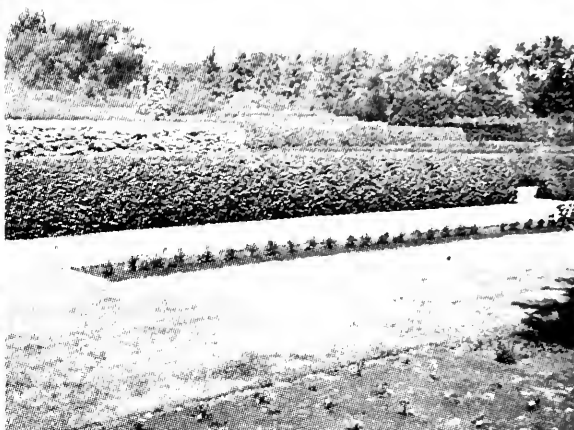
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Views of the hedge garden at the Morden research station.

HEDGES FOR THE PRAIRIES

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Revised by H. H. MARSHALL and W. A. CUMMING

Research Station, Morden, Manitoba

Hedges are now used for many purposes. A hedge can be a thing of beauty in itself, a screen to hide unsightly objects, a shelter from harsh winds, or a background for colorful flower borders. Well-tended hedges can provide shelter and privacy that will add to the enjoyment of outdoor living areas.

Today, the architecture of homes, offices and public buildings lends itself to the use of hedges at foundations. They may be used to separate the various sections of the garden or mark the boundary of the property. A medium-tall hedge may screen the service and clothes-drying area from the outdoor living room; a low hedge may provide a break between the flower and vegetable garden.

A hedge should not be merely ornamental; it should serve a useful purpose. Sometimes a hedge bordering a driveway is in good taste but it can also trap snow, piling it in the driveway where it becomes a nuisance. Low, square-cut hedges accentuate horizontal lines and generally enhance the best features of the buildings. Turreted and buttressed hedges of medium height may be effectively used to vary the plain lines of some architecture.

This publication is the result of 40 years of testing hedge plants at the Research Station, Morden, Man. So far, 140 species

¹Retired.

and cultivars have been tested. Twenty-three hedges from the original planting in 1931 remain in good condition.

All the photographs in this publication were taken in the hedge garden at the Station.

CHOOSING A HEDGE

Give serious thought to the most suitable type of hedge for a particular need or location. With the long prairie winter in mind, you may want a tall evergreen hedge that provides shelter and gives a feeling of warmth and comfort. Or, as a relief from somber tones of evergreens, put in a hedge of shrubs that have colorful bark, such as willow and dogwood.

You must consider initial costs as well as those of upkeep. Evergreen hedges cost more to establish than deciduous ones. On the other hand, they need less pruning; usually once a year is enough. Also, if evergreen hedges get out of hand they cannot be rejuvenated by hard pruning, whereas deciduous ones can.

Consider, too, your soil and site. Some hedge plants, such as saltbush, buffaloberry and Russian olive, will grow in alkaline soil. Others, such as pines, Amur maple, and species of *Malus* and *Pyrus*, thrive in slightly acid soils. Some shrubs that will grow in shade include dogwoods, viburnums, and euonymus.

Choose hedge plants that can be kept in proportion to their surroundings. Hedges with large coarse leaves have no place around the urban home as they make other plantings seem crowded. Fine-textured, small-leaved plants, on the other hand, give the effect of spaciousness. Hedges with purple, golden, or gray foliage are suitable only in large, well-planned gardens.

On the farm, hedges have a particular appeal. They can be used to screen farm buildings, to give privacy, and perhaps most important, to give shelter from the wind and relief from the boundless open space of the prairies.

Some good plants for specialized uses or purposes are given in the following lists.

Hedges for protection against animals

Some spiny or thorny plants help to keep wild or domesticated animals away from a particular area. Multiflora rose, often described as a living fence, is *not* hardy on the Canadian prairies.

The following are useful:

Hawthorn

Saltbush
Spiny caragana
Pygmy caragana
Hardy shrub roses
Cherry prinsepia
Canada plum

Hedges that have colorful bark and twigs

You can brighten the winter landscape with
Siberian dogwood
Golden willow
Redstem willow
Littleleaf linden

Hedges that flower

For a satisfactory flowering hedge (Figure 1) use the pruning techniques outlined on page . In this respect, the following have been good at Morden.

Threelobe spirea
Garland spirea
Anthony Waterer spirea
Froebel spirea

Figure 1 — A flowering hedge (Scotch rose).



Common lilac
Altai rose
Cinnamon rose
Shrubby cinquefoil

Hedges that grow quickly

The Siberian elm (*Ulmus pumila*) is the fastest-growing hardy hedge plant. A 2-year-old hedge at Morden grew 3 ft (0.9 m) in one season. The hardy Manchurian strain of this elm is variously known as Dropmore elm, Harbin elm, Manchu elm, and Chinkota elm.

PREPARING THE SOIL

In most parts of the prairies the soil is fertile enough and needs little special preparation before a hedge may be planted. Dig the soil 15 to 18 in. (38 to 46 cm) deep and mix in 4 oz (113 g) of ammonium phosphate (11-48-0 or 16-20-0) for each lineal yard of hedge. If sandy soils are low in humus, give them a dressing of 3 to 4 in. (8 to 10 cm) of well-rotted barnyard manure. If possible, prepare the soil in the autumn for planting in the spring. Set out deciduous hedges in late April or early May, evergreens in late May or early August. The latter date is preferred at Morden, but only when soil moisture is adequate or a satisfactory means of watering is available.

KINDS OF PLANTS TO USE

Deciduous plants

Young vigorous plants with plenty of fibrous roots make the best hedges. Two-year-old plants that have been transplanted in the nursery are easy to establish, economical, and better in every way than larger ones. If you need many plants, get 1-year-old seedlings. These are much cheaper and with a little extra care they will give satisfactory, if somewhat slower, results. Crowding small plants into the row does not speed up the establishment of the hedge.

Evergreens

Use seedling pines, spruce, or cedar, 3 to 5 years old, that have been transplanted in a nursery. They are easier to establish and more economical than larger specimens. If you don't mind the cost and want an immediate hedge, use large specimens of spruce or cedar. Pines, however, must be planted when they are small.

Where eastern white cedar is reliably hardy, it is one of the best evergreen hedges. In the prairie region, cedar hedges must have some protection from the southwest or sunscald may brown the exposed parts.

PLANTING

For deciduous hedges that are to be kept at medium heights, space the plants 1½ ft (0.45 m) apart in a single row. A double row of plants doubles the cost of the hedge and is harder to look after. For informal barriers, space plants 2 ft (0.6 m) apart; for dwarf hedges, space them 1 ft (0.3 m) apart.

Space evergreens 2 ft (0.6 m) apart, except the dwarf forms of cedar, which are best planted 1½ ft (0.45 m) apart. Plant evergreens used as windbreaks 4 ft (1.2 m) apart.

Use a garden line to make a straight row and mark off divisions at required spacing. For each plant dig a hole large enough to contain the roots without crowding. Set the plants as deep as, or a little deeper than, they were growing in their previous location. Place the plant in the center of the hole and fill in the soil, gently shaking the plant so that the loose soil is worked down among the roots. Make the soil very firm by tramping.

Make sure that the tree or shrub does not dry out while it is being planted. Do not lay out the whole row. Small plants can be carried in a pail partly filled with water. Larger ones are more conveniently carried in a piece of wet burlap. When the planting is finished leave a large saucer-shaped depression around each plant. Soak the plants thoroughly and level the soil after the water has seeped away.

PRUNING AND SHAPING

Deciduous hedges

When you use 1- or 2-year-old stock, cut it back to within 6 to 9 in. (15 to 23 cm) of the ground. This will force new shoots to grow near the ground and so lay the foundation for a dense hedge. When you have older plants, do not prune them so severely; remove not more than a third of the total height of the plant. The aim is to develop, as quickly as possible, a thick, bushy hedge with many low, twiggy growths. Unless you prune the stock properly at planting time, plants will be leggy and you will never have a satisfactory hedge.

The most important phase of hedge making comes in the early stages of the plant's development. A good foundation

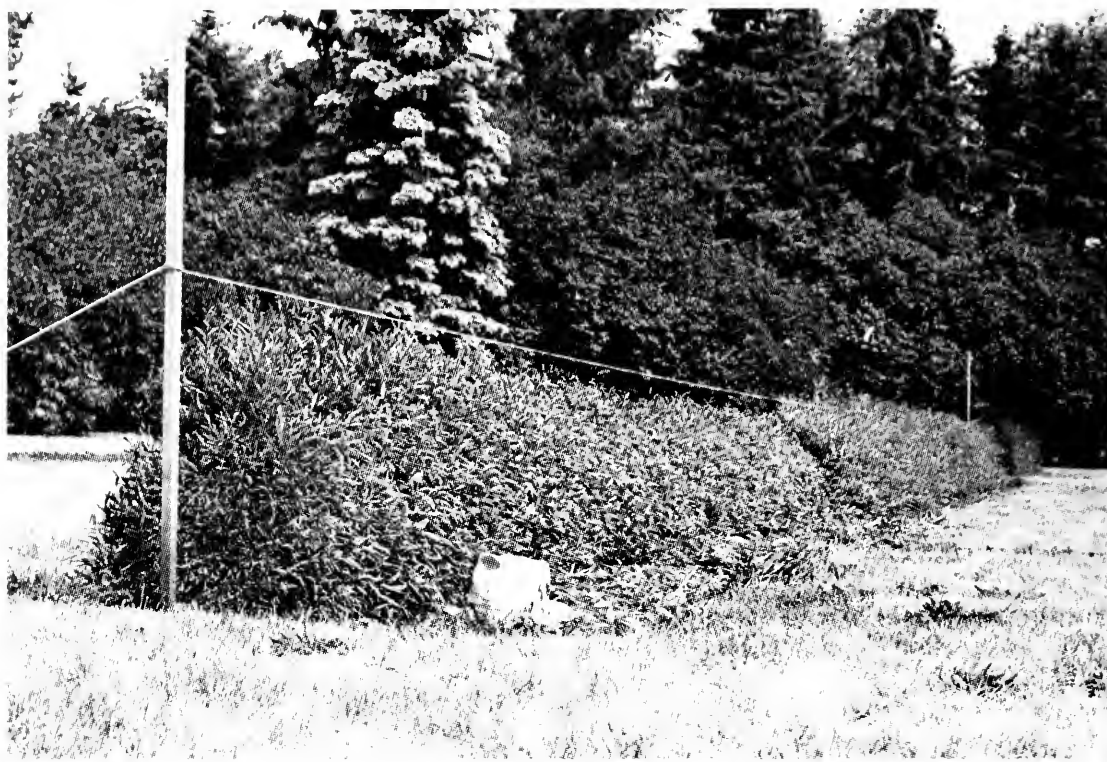


Figure 2 — In trimming a hedge a cord is used to mark the height. The hedge in this picture is Pallas buckthorn.

can best be laid when the plants are shaped for the first time. The shape that best combines beauty with utility is sometimes called the 'inverted vee' or 'narrow pyramid.' To be in good proportion, such a hedge should be 3 ft (0.9 m) wide at the ground and 5 ft (1.5 m) high. The top should be slightly rounded and not more than 1 ft (0.3 m) wide. A hedge having a narrow top is easier to trim than one having a very wide one. It will remain alive and thrifty right to its base, because all of it will be fully exposed to the sun.

After the first pruning done at planting time, and except for weeding, no further attention is needed until the following spring. Make the first shaping of the hedge then. Use a garden line to keep the work straight (Figure 2). Some hedges may be kept reasonably neat and tidy when trimmed only once a year. Others need to be trimmed three or four times. Some of the hedges that need trimming only once a year are: tamarisk, hawthorn, saltbush, saskatoon, lilac, potentilla, American elm, green ash, mossycup oak, willow (coppiced).

Hedge plants that need more than one trimming a year are: Siberian elm, cotoneaster, prinsepia, Amur maple, alpine currant, honeysuckle, caragana.

Hedges recommended for one annual trimming should not be pruned before the last week of June. By that time most of them will have completed their season's growth. The hedges needing two or more trimmings should have the first trimming in mid-June, the second in late July, and the final one if necessary in early September. Shrubby cinquefoil may be trimmed once a year at this time.

Evergreen hedges

Evergreen hedges are not pruned in the same way as deciduous ones. No pruning is necessary at planting time, and practically none for the first 2 years after planting except to prune the leaders back. Coniferous evergreens do not recover from hard pruning and at no time should they be pruned beyond the current year's growth.

Prune spruce hedges only once a year, in early July. Cut off part of the current year's growth with pruners or a sharp knife. As the hedge becomes dense with age, you can prune effectively and more rapidly with a pair of hedge shears.

Pine hedges, especially those of the long-needled species, look more pleasing when they are carefully trimmed with pruners or a knife. Indiscriminate use of hedge shears results in mutilated needles and loss of the natural beauty of a pine hedge.

Hedges of eastern white cedar have a long season of growth and need two trimmings to keep them neat. Make the first in early July, the second in early September. You may trim the hedge closely, to give a neat appearance, without harming the plants.

A type of hedge trimming that was popular in the Victorian era and known as topiary fell out of favor at the turn of the century. This art was in keeping with the formal and geometric design of gardens then in vogue. Figures of birds and animals were shaped at the tops of slow-growing hedges such as yew or holly, and other shapes such as turrets, buttresses and windows. The work took considerable skill and a good deal of time.

Flowering hedges

In flowering hedges the wood produced the previous year bears most of the bloom and must not be cut off when the hedge is pruned. Common lilac, spirea and shrub roses, grown as flowering hedges, should be pruned every second year as soon as the flowers have faded. Cut out to the base of the plant all old wood and reduce the remaining shoots to two-thirds of their length, pruning to a point where new growth is develop-

ing. You may need to cut out some younger wood to maintain a well-shaped hedge.

Common lilac needs ruthless desuckering to keep it within bounds. Do this in early spring as soon as the frost is out of the ground, or in the late autumn after the leaves have fallen. The work is best done with a sharp spade. Sever the shoots fairly close to the center of the hedge but keep in mind the recommended ideal dimensions.

Rejuvenating old hedges

Old deciduous hedges that have become unthrifty and unsightly may be restored to health and beauty by hard pruning (Figure 3). The following method has proved satisfactory at Morden.

In October the main trunk and heavy branches are cut back with tree pruners or a pruning saw. The smaller side branches and basal shoots are left intact until the following April, when they are pruned fairly close to the main trunk. The main center shoots are then about 2 ft (60 cm) high and the skeleton outline of the rejuvenated hedge has the same proportion of width to height as it had formerly. No further pruning is done until the following year, except to reduce the most vigorous shoots to half their length in July. Thereafter the pruning pattern follows that for young deciduous hedges (page 9).

Evergreen hedges that have lost their beauty through old age or accident cannot be restored in the same manner as deciduous ones because the plants do not develop new shoots

Figure 3 — Rejuvenating a hedge of common lilac: left, severely pruned; right, the same hedge 5 weeks later.



from the old wood. They have to be taken out and replaced with young stock.

Hedges with colorful winter bark

Golden willow, redstem willow, and Siberian dogwood are esteemed for their brightly colored twigs in winter. To maintain this color in the willows, coppice them in late April each year (Figure 4). Cut back all the previous year's growth to one or two buds. Many shoots grow from the stubs and develop into 5- to 6-ft (1.5- to 1.8-m) wands that light up the winter landscape.

The Siberian dogwood cannot be given the same treatment. If you cut out most of the old wood every third year, however, you will keep the hedge vigorous and colorful.

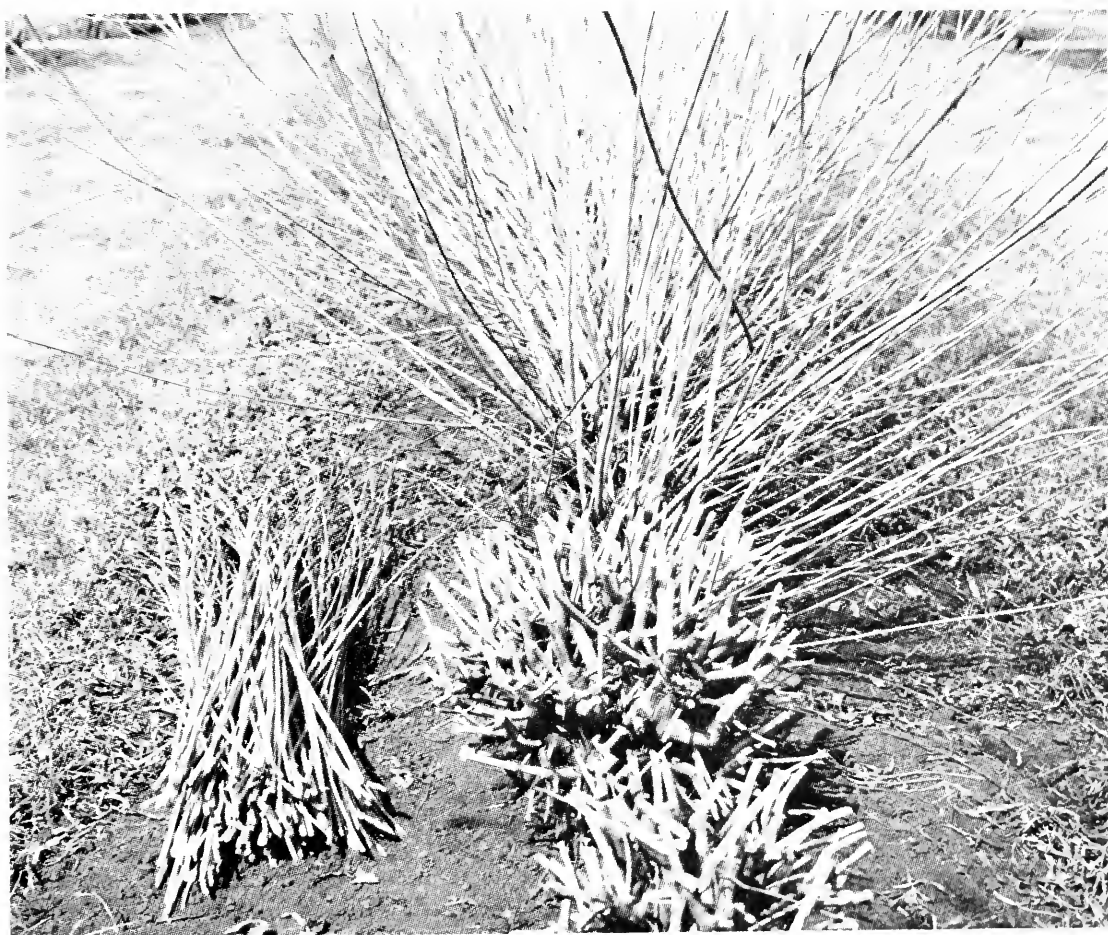


Figure 4 — Coppicing a willow hedge.

Laying

Old hedges of hawthorn, pear, and crabapple that have become shabby may be rejuvenated by a method of pruning



Figure 5 — *Laying: left, stubs of branches that have just been cut; right, the same hedge 2 years later.*

called 'laying' (Figure 5). In April, cut most of the old wood back to stubs 1½ ft (0.45 m) high. Lay the remaining young growths in a horizontal position and tie them down to the stubs. New growths, starting from these 'laid' branches, soon cover the stubs and by the end of the season the hedge looks as good as ever.

FERTILIZING

In most prairie gardens the soil is rich in nutrients, often containing more than hedge plants need. When the hedge shows signs of having exhausted the soil, dig in 3 or 4 in. (8 or 10 cm) of well-rotted barnyard manure. In dry areas, a mulch of straw or lawn clippings, put on in early summer, will help a newly planted hedge. Apply 1 lb of 16-20-0 fertilizer for each 10 ft (3 m) of hedge before you put the mulch on.

PESTS AND DISEASES

Hedge plants, like all others, may be attacked by insects, mites, or diseases. Occasionally, insects or mites may become so abundant that they have to be controlled. Diseases of hedges are not a serious problem. Some varieties used for hedges, however, are subject to leaf spot, rust, powdery mildew and fire blight.

Control

Insect and disease control methods are not described here

because they change frequently. Ask for your provincial publication "Insect Control on Ornamental Plants." Recent publications on disease control are also available but short descriptions of the pests are included for your convenience.

Leaf-eating caterpillars and beetles

These insects often do serious damage before they are noticed. Watch for them throughout the summer but particularly in June and August. Pear slugs may defoliate cotoneaster, hawthorn, pear, plum and other species in late summer. Small numbers of insects are usually present and may be kept under control by birds and predators. If they become numerous, spray with the recommended insecticide.

Spider mites

These tiny pests attack many species of plants but often cause severe injury to pygmy caragana, potentilla and honeysuckle. They may be found on the under sides of leaves and crossing between leaves on webs. They are so small that they are difficult to see.

Aphids

Various species of these fast-multiplying soft little insects attack most plants at some time, including alpine currant, American elm, spruce, and many other hedge plants. Their white discarded skins or the sticky honeydew (sap) produced by them may be the first evidence that they are becoming numerous.

Scale insects

Several species of scales attack hedge plants. The most common are the scurfy scale and the pine needle scale. Cotoneaster, hawthorn, crabapple, and Ussurian pear are the most common host plants of the scurfy scale. When the infestation is heavy, the plant is weakened enough to become susceptible to winter injury. Whole hedges have been killed by this scale. Pine needle scales attack all species of pine, fir, and spruce. Their covering is white, easily noticed, and likely to be found on old hedges in well-sheltered gardens. The shell-like covering of these insects prevents insecticides from reaching them. However, for a brief period in early June the newly hatched insects leave the protective cover, and only at this time can they be killed.

Fire blight

Cotoneaster, crabapple, Ussurian pear, and saskatoon are all susceptible to fire blight. Severe attacks of this bacterial disease are not uncommon after a spell of high humidity during June. New stems and leaves suddenly wilt and soon turn brown. No satisfactory chemical control for fire blight has yet been found. Cut out the diseased portions of the plant well below the point of infection; take care not to transmit the disease by careless handling of the diseased portions or by the pruning equipment. Burn all diseased parts immediately and clean the tools with a solution of lysol.

Powdery mildew

Common lilac and alpine currant are often attacked by powdery mildew, especially when growing in partly shaded sites where the air circulation is poor.

Leaf spot

Leaf spot disease can seriously disfigure foliage. Caragana, alpine currant, and hawthorn are most susceptible. In wet weather many other kinds of hedge plants are infected.

NOTES ON THE HEDGE PLANTS AT MORDEN

The hedge test garden at the Research Station, Morden, Man., is surrounded by tall evergreen and deciduous trees, which give good protection from wind and trap snow in the area. In the summertime, it provides an attractive setting for what has become a special feature of the ornamental projects carried on at Morden. Most of the test hedges are 50 ft (15 m) long and separated by a strip of grass 9 ft (2.7 m) wide. There are four hedges in each row and between rows there is a grass walk 10 ft (3 m) wide. In some instances the length allotted to one species has been equally divided between two dwarf varieties, thereby increasing the number of varieties on test.

On the following pages, plants are listed alphabetically by scientific name. The index to common names is found on page 33.

Abies balsamea. Balsam Fir. This evergreen made a dense hedge especially suited to shade. After 30 years, it finally became open at the sides and has been removed.

Acer ginnala. Amur Maple. The second hedge of this species was grown from seedlings selected for bright red autumn color. Set out in 1954, it is now 11 ft (3.4 m) high and 6 ft

(1.8 m) wide at the base. With closer trimming it may be maintained at 3-5 ft (0.9-1.5 m) in height. The Amur maple makes a fine hedge; hardy, colorful in autumn and long lived. It is subject to chlorosis when planted in soil with a high lime content.

Acer negundo. Boxelder. This hardy tree was maintained for 15 years as an informal barrier 18 ft (5.5 m) high and 6 ft (1.8 m) wide at its base. The main trunks of the plants were 3½ in. (8.9 cm) in diameter when the hedge was removed. Boxelder is recommended only as a quick-growing temporary hedge.

Amelanchier alnifolia. Juneberry or Saskatoon. This well-known native plant makes a good, hardy, long-lived hedge. However, it has several faults. It suckers, is susceptible to fire blight, and is an alternate host for cedar-apple rust. The Morden hedge planted in 1931 is 5 ft (1.5 m) high and still in good condition.

Berberis. Barberries may not be sold because they are the alternate host of stem rust on wheat, a crop plant of some importance on the prairies.

Betula papyrifera. Paper Birch has an attractive, graceful natural form and will make a beautiful informal hedge where space is available. The trimmed hedge at Morden set out in 1946, is now 11 ft (3.4 m) high and in excellent condition.

Caragana arborescens. Siberian Caragana. This hedge was removed to make room for testing more choice material. It is esteemed for its extreme hardiness, drought resistance, and utility as a windbreak. It grows to 18 ft (5.5 m).

Caragana brevifolia. Shortleaf Caragana. This graceful, fine-leaved plant makes a choice, hardy hedge. It is recommended as a border hedge, which may be kept at 1 ft (0.3 m). It has been free of spider mites, whereas pygmy caragana is susceptible to heavy infestation.

Caragana frutex 'Globosa'. Globe Caragana. This roundish, dense, and hardy shrub makes a hedge that needs scarcely any trimming. Set out in 1946, it is now 2 ft (0.6 m) high and about 1 ft (0.3 m) wide at the base.

Caragana maximowicziana. Maximowicz Caragana. This dense-growing, spiny caragana is not adapted to prairie conditions. The Morden hedge suffered moderate to severe winter injury repeatedly, which necessitated heavy spring pruning and, finally, its removal.

Caragana microphylla 'Tidy'. Tidy Caragana. This bud sport originated at Morden. Its fern-like foliage is free of disease, brilliant green, and attractive over a long season. It became

very thin at the base after 15 years and was removed. Plants on their own roots are best.

Caragana pygmaea. Pygmy Caragana. This popular hedge was set out in 1931 and has been kept closely clipped to a height of 2 ft (0.6 m). Hard pruning was necessary when heavy snow crushed the hedge. Pygmy caragana tends to become very broad at the base and you should narrow it when you cut back the hedge. You must control spider mites or the plants will look rusty by August.

Caragana spinosa. Spiny Caragana. This species has made a dense, spiny hedge 2 ft (0.6 m) high and 1 ft (0.3 m) wide. It is less hardy than *C. pygmaea* but more rigid, and stands the weight of snow better. The Morden hedge is 30 years old.

Celtis occidentalis. Hackberry. The hackberry, a rare native tree similar in appearance to the American elm, is healthy, hardy, and a fairly rapid grower. The leaves are often killed by late spring frosts, and when frost damage is severe the plants look shabby until well on into the summer. Hackberry responds to hard pruning in the same manner as the American elm. The present hedge has reached 12 ft (3.7 m) and is 3 ft (0.9 m) wide.

Cornus alba 'Sibirica'. Siberian Dogwood. This hedge, set out as hardwood cuttings in the spring of 1959, has not become well enough established to be evaluated. The bright red winter bark makes this variety of dogwood particularly attractive.

Corylus americana. American Hazelnut. A native plant that is well suited to hedge making, the American hazelnut is hardy and tolerant of shade, and has colorful autumn foliage. This hedge planted in 1931 is 4 ft (1.2 m) high and very dense.

Cotoneaster integerrima. European Cotoneaster. This cotoneaster is less useful as a hedge plant than as a specimen shrub. It is inclined to be sprawly and more open than the hedge cotoneaster. The leaves are rather dull and are gray on the undersides. This hedge, planted in 1931, has been kept as a clipped hedge 4 ft (1.2 m) in height.

Cotoneaster lucida. Hedge Cotoneaster. Commonly available as *C. acutifolia*, this plant is well named. It has small leaves and twiggy, dense growth that withstands the several seasonal trimmings necessary to keep the hedge in good condition. To rejuvenate the hedge you can safely cut back old plants in April. Fire blight, scurfy scale, ugly nest tortrix and pear slug will all cause serious damage unless controlled.

Crataegus chrysocarpa. Fireberry Hawthorn. Most hawthorns make ideal hedges. Planted in 1931, this hedge has been maintained at 5 ft (1.5 m) by occasional hard pruning in April.

It is a less vigorous species than *C. succulenta* but makes a neater hedge.

Crataegus mordenensis 'Toba'. Toba Hawthorn. This hawthorn is a hybrid of *C. oxyacantha* and *C. succulenta* developed at Morden, and was set out as a hedge in 1946. Because of its rather open base, Toba hawthorn is not satisfactory as a hedge.

Crataegus rivularis. River Hawthorn. Plants of this upright hawthorn are twiggy and small-leaved, and stand repeated trimming very well. The hedge, set out in 1946, is 6 ft (1.8 m) high and 2 ft (0.6 m) wide.

Crataegus succulenta. Fleshy Hawthorn. This native plant was used to make a hedge in 1931. It has been kept at a height of 5 ft (1.5 m). Occasionally it has had to be rejuvenated.

Elaeagnus angustifolia. Russian Olive. This gray-leaved ornamental tree has not made a satisfactory hedge at Morden. Two strains have been tested and neither has remained thrifty for any length of time. Russian olive is subject to dieback and whole sections of the hedge have killed out for no apparent reason. It tolerates dry saline soil and for a brief span, when plants are young, it can be attractive.

Euonymus alata. Winged Euonymus. This plant makes a sturdy hedge (Figure 6). It has small foliage and twiggy growths

Figure 6 — In the foreground, a hedge of winged euonymus; center, grafted Colorado blue spruce.



that are winged with corky bark. Foliage and fruits are colorful in autumn. It was planted in 1946 and is now 7 ft (2.1 m) high, 4 ft (1.2 m) wide, and dense.

Euonymus europaea. European Euonymus. This made a fairly good hedge 6 ft (1.8 m) high and 2 ft (0.6 m) wide at its base. Repeated attacks of mildew kept the plants unsightly during the growing season. Severe winters caused moderate tip killing.

Euonymus nana. Dwarf Euonymus. This neat, semi-ever-green plant has been maintained as a 1-ft (0.3-m) hedge for 30 years. It is well adapted to shade and does well in soil that has not much lime. If the plants are well sheltered from north-west winds, they retain most of their leaves during winter. Severe winter injury has sometimes occurred but a heavy pruning has restored the plants before the end of the growing season. It is recommended for a good dwarf hedge.

Euonymus nana 'Turkestanica'. Turkestan Euonymus. This taller and hardier form of *E. nana* makes a good hedge in either sun or shade. It tolerates dry soil and needs little care except an annual trimming. This hedge, set out in 1954, is 3 ft (0.9 m) high and becoming uneven.

Fraxinus pennsylvanica subintegerrima. Green Ash. This is another native tree that could be more widely used as a tall hedge. It is hardy and long-lived, and stands pruning well. A specimen at Morden set out in 1931 was 12 ft (3.7 m) high when cut back to a height of 2 ft (0.6 m) in 1958. Vigorous shoots, put forth from the base, quickly covered the unsightly stumps and after one season the hedge was completely rejuvenated. In 1971 it was 12 ft (3.7 m) high and in very good condition.

Halimodendron halodendron. Saltbush. The saltbush is a useful hedge plant that tolerates saline soils and dry weather. After 30 years it is 5 ft (1.5 m) high, 2 ft (0.6 m) wide at the base, and in fairly good condition. Its greatest fault is its wide-spread suckering.

Juniperus rigida. Needle Juniper. This hedge survived for 6 years, when it was killed to ground level. It was dense and spiny and made a most attractive hedge, but much too tender for the prairie regions.

Juniperus scopulorum. Rocky Mountain Juniper. This fairly dense shrub made an attractive hedge as long as it was healthy. It became unthrifty and was finally discarded after a severe attack of cedar-apple rust. A dwarf form of the Rocky Mountain juniper selected at Morden stands close pruning. Planted out in

1957 it is now 3 ft (0.9 m) in height, 2 ft (0.6 m) wide and in good condition. It is well adapted to dry soil and heat.

Larix laricina. Tamarack. This native tree is not as well adapted for a hedge as the Siberian species. The foliage is shorter and more bluish green and there is considerably more dieback of the lower branches.

Larix sibirica. Siberian Larch. Thirty years after planting, this hedge is only 6 ft (1.8 m) high and 4 ft (1.2 m) wide. A few dead twigs appear from year to year, but otherwise the hedge is in good condition. It is very attractive in early summer when the needles are bright green, and again in September when they turn gold.

Ligustrum vulgare. Common Privet. This is a very popular hedge plant in milder climates but is not recommended for prairie gardens. Winter injury is sometimes severe. The hedge planted in 1954 has been removed.

Lonicera coerulea edulis. Sweetberry Honeysuckle. An ideal hedge plant with dense foliage and rigid, twiggy growth, the sweetberry honeysuckle is fully hardy, completely free of pests and disease and resistant to drought. It was planted in 1946 and has been kept at a height of 4 ft (1.2 m). It is excellent for a neat, attractive hedge that is easy to maintain.

Lonicera maximowiczii sachalinensis. Sakhalin Honeysuckle. This honeysuckle was planted in 1955. It is 2 ft (0.6 m) high and 1 ft (0.3 m) wide at the base, and makes a choice, hardy hedge of medium height. It is superior to other honeysuckles tested here except the sweetberry honeysuckle. The foliage is dense, dark green, durable, and free of pests.

Lonicera morrowii. Morrow Honeysuckle. This Japanese is less hardy than the Manchurian honeysuckle, spreads more, and is equally subject to dieback of the lower branches. To keep it in good shape give it an occasional hard pruning. It is 5 ft (1.5 m) high, 2 ½ ft (0.76 m) wide at the base, and 30 years old.

Lonicera ruprechtiana. Manchurian Honeysuckle. This hedge, planted in 1931, has been rejuvenated several times by cutting the plants back to 1 ½ ft (0.45 m) in the spring. Because it is subject to dieback of the lower branches when kept at 5 to 6 ft (1.5 to 1.8 m) for several years, it needs periodic hard pruning. It was planted in 1931.

Lonicera tatarica. Tatarian Honeysuckle. As a hedge plant, this honeysuckle has no merit except hardiness. Its winter appearance is ghost-like and most uninteresting. You must do much heavy pruning to keep the plants thrifty. The hedge was replaced in 1955 after being kept at 5 ft (1.5 m) for 24 years.

Lonicera xylosteoides 'Clavey's Dwarf' Honeysuckle. This new dwarf, and compact honeysuckle was set out in 1958. It has made a good hedge 4 ft (1.2 m) in height.

Malus baccata. Siberian Crabapple. This hardy, small tree makes a very good hedge and can be kept at 5 or 6 ft (1.5 or 1.8 m) for 10 years or longer. Its chief faults are susceptibility to fire blight and the scurfy scale.

Malus 'Leslie'. Leslie Crabapple. This purple-leaved rosy-bloom crabapple selection was first planted in 1946, and was kept at a height of 5 to 8 ft (1.5 to 2.4 m) for several years. It was removed in 1971 because suckers from the rootstock had replaced most of the original trees.

Malus 'Strathmore'. Strathmore Crabapple. This well-known rosybloom makes an upright, dense, hardy hedge. Its foliage is less colorful than that of 'Leslie'. The tips of the new growth are silvery. It stands clipping well and can be kept at a height of 5 ft (1.5 m) for many years. It was removed in 1971 for the same reason as the above cultivar.

Malus transitoria. Tibetan Crabapple. This crab resembles the English hawthorn in foliage and general appearance. It makes a dense, rigid hedge of fairly slow growth. It was planted in 1946 and is now 2 ft (0.6 m) high and 1 ft (0.3 m) wide at the base. It is propagated by means of budding on hardy crabapple rootstocks.

Philadelphus 'Audrey'. Audrey Mockorange. This hardy mockorange, a selection raised at Morden, is naturally twiggy, densely clothed with small, dark green leaves, rigid and upright. It is most effective as an informal hedge that permits the full expression of its showy, sweet-scented blossoms.

Philadelphus lemoinei. Lemoine Mockorange. This small-leaved shrub with sweet-scented flowers makes a neat hedge. It also makes an attractive informal barrier when pruning is restricted to cutting out dead wood in the spring. It was considered too tender for the prairies and was replaced with 'Audrey'.

Picea glauca. White Spruce. This common tree makes a handsome, tall, evergreen hedge. It was slow growing and thrifty for 30 years with close annual pruning. It has been removed and replanted with young trees.

Picea pungens. Colorado Spruce. This species (Figure 7), planted at the same time as the white spruce hedge, is beginning to deteriorate. It remained in excellent condition for 25 years. A new hedge has been planted.



Figure 7 — An evergreen hedge of Colorado spruce seedlings.

Picea pungens glauca. Colorado Blue Spruce. A mixed hedge of grafted blue spruce selections, 3 ft (0.9 m) high, was planted in 1946. The hedge (Figure 6) was 6 ft (1.8 m) high and 3 ft (0.9 m) wide at the base in 1962. It was an excellent hedge at that time but in 1971 it was 10 ft (3.0 m) in height and becoming patchy.

Pinus cembra. Swiss Stone Pine. This is a slow-growing, choice pine. The hedge, set out in 1947, now stands 8 ft (2.4 m) high and 3 ft (0.9 m) wide and is becoming open on the sides.

Pinus contorta latifolia. Lodgepole Pine. Planted in 1947, the hedge is now 5 ft (1.5 m) high and 2 ft (0.6 m) wide at the base. Its condition is only fair; the needles continually go brown. It is not as tolerant of lime soil as the Swiss mountain pine.

Pinus mugo. Swiss Mountain Pine. This hedge was allowed to grow naturally to a height of 11 ft (3.4 m) and a spread of 8½ ft (2.6 m). It had to be removed because it interfered with adjacent hedges and killed out the surrounding grass.

Pinus mugo pumilio. Dwarf Swiss Mountain Pine. A grafted form of this species is making a distinctive hedge. It was planted in 1955 and is 6 ft (1.8 m) high, 5 ft (1.5 m) wide, dark green, and completely hardy. It is highly recommended.

Pinus resinosa. Red Pine. Set out in 1954, the red pine has

made a fairly good hedge 6 ft (1.8 m) high. Some traces of chlorosis give the hedge an objectionable yellowish cast.

Pinus sylvestris. Scotch Pine. This hedge was allowed to develop as a natural barrier, growing to a height of 18 ft (5.5 m). It was discarded because it interfered with adjacent hedges.

Potentilla fruticosa. Bush Cinquefoil. This native plant made a desirable hedge, being kept in good condition for many years. It was replaced with Farrer's bush cinquefoil in 1956. This species will also make an informal, free flowering hedge 3 ft (0.9 m) in height if trimmed once a year in September. Trimming should remove most of the seed heads and uneven parts of the hedge.

Potentilla fruticosa 'Coronation Triumph'. This new cultivar introduced from the Tree Nursery, Indian Head, Sask., by John Walker was planted as a hedge in 1969. Its firm compactness, fine twiggy growth, small bright green leaves and bright yellow flowers all summer long, give promise of an excellent dwarf flowering hedge.

Potentilla fruticosa 'Farreri'. Farrer's Bush Cinquefoil. This fine-leaved form of *P. fruticosa* makes a neat, dwarf hedge. Its dark green foliage and starry, bright yellow flowers are attractive from July until October.

Prinsepia sinensis. Cherry Prinsepia. This hardy early-leaving plant makes an excellent hedge for a sunny location. It tolerates drought well and has few problems with insects or disease. It provides a spiny barrier without appearing unpleasantly rough. A specimen at Morden was kept at a height of 2½ ft (0.76 m) for 30 years. It will also make an excellent 6 ft (1.8 m) untrimmed hedge. The red, edible fruits are attractive in autumn.

Prinsepia uniflora. Hedge Prinsepia. In the milder sections of Canada this plant would make an ideal hedge. It has spiny stems clothed with small, dark green, glossy leaves. At Morden it suffered moderate to severe winter injury and was removed.

Prunus cerasus. Sour Cherry. Russian varieties of the true sour cherry have made a very handsome hedge with dark green, glossy foliage. It was maintained as a clipped hedge 4 ft (1.2 m) high and 2 ft (0.6 m) wide for 15 years. Suckering is a serious fault. These sour cherries are hardy at Morden but too tender for general prairie culture.

Prunus cistena. Purpleleaf Sandcherry. This shrub has very attractive and colorful foliage but it suffers moderate to severe damage from cold. It is not recommended for prairie gardens,

but would make a good hedge in milder climates.

Prunus nigra. Canada Plum. The native wild plum made a rigid, spiny hedge that was kept 6 ft (1.8 m) high. Suckers sprang up in the surrounding grass area and plants often suffered from leaf spot, which caused premature leaf drop. These faults led to its removal after 20 years.

Prunus pensylvanica. Pin Cherry. This native plant is not suited to hedge making. It did not stand hard pruning or close clipping and was discarded because of its poor condition after 15 years.

Prunus tenella. Russian Almond. This plant made a neat hedge in the early years of its establishment. Its persistent suckers, which spread to adjacent areas, interfered with grass cutting. Spider mites also attacked it. For these reasons it was removed.

Prunus tomentosa. Nanking Cherry. This shrubby cherry needs much attention to keep it healthy and vigorous. It needs a hard pruning and removal of dead wood about every third year. It makes an attractive hedge about 3 ft (0.9 m) high and 1½ ft (0.45 m) wide at the base.

Prunus virginiana. Common Chokecherry. This native plant makes a satisfactory hedge. It is hardy, free from pests, and fairly dense. You must rigorously cut out suckers or the hedge will become too wide.

Prunus virginiana melanocarpa. 'Shubert'. Shubert Chokecherry. This purple-leaved mutation of the western chokecherry was set out in 1946. It has grown into a distinctive hedge 5 ft (1.5 m) high and 2 ft (0.6 m) wide at the base. Plants grafted on chokecherry can be expected to sucker moderately. *Prunus padus* is preferred as an understock.

Pyrus ussuriensis. Ussurian Pear. The hardy pear is perhaps more useful as a tree than for a hedge. It will, nevertheless, respond to pruning very well and make an attractive tall hedge with fine glossy leaves that take on rich autumn colors. The present specimen is 6 ft (1.8 m) high, 3 ft (0.9 m) wide at the base, and 30 years old.

Quercus macrocarpa. Bur Oak. The native oak is not a tree usually associated with hedge making but it has been used with satisfactory results at Morden (Figure 8). The hedge, set out in 1931 with 4-year-old seedlings, was very slow in starting but made fairly rapid growth later. It is now 12 ft (3.7 m) high and 6 ft (1.8 m) wide at its base. It is the last of the deciduous hedges to leaf out in the spring and often is not completely clothed until June. It is a handsome and satisfactory tall hedge,



Figure 8 — *Bur oak* makes a novel and interesting hedge in both summer, left, and winter, right.

interesting even in the winter, when the peculiar corky bark of stem and branch is revealed.

Quercus mongolica. Mongolian Oak. This very hardy, shrubby oak was planted in 1954. It comes into leaf early and if then touched by frost it is slow to recover. Plants are often fully clothed with new leaves in April, frozen in May, and bare of foliage in June. The leaves turn reddish brown in the fall and stay on the plants most of the winter.

Rhamnus species. Buckthorns. These plants may not be sold on the prairies because they are the alternate host of oat crown rust and other rust species.

Rhus trilobata. Skunkbush Sumac. A small-leaved plant with clusters of reddish fruits. This sumac stands trimmings remarkably well and tolerates drought. Planted in 1931 it has been kept to a height of 3 ft (0.9 m) but it is now becoming patchy.

Ribes alpinum. Alpine Currant. A Morden selection of this species is a naturally dwarf, compact shrub, well adapted for use as a low hedge. The leaves are small, glossy, and dark green. This selection is resistant to leaf spot, which often mars the beauty of the Siberian currant. It can be maintained at 1½ to 2 ft (0.45 to 0.6 m) for many years.

Ribes diacanthum. Siberian Currant. This is a dense, twiggy shrub that is well adapted as a hedge plant. The foliage is small and bright green and, if kept free of leaf spot, is attractive throughout the growing season. The specimen at Morden is 3 ft (0.9 m) high and 1½ ft (0.45 m) wide. It is not quite as good as Alpine currant.

Ribes 'Dakota Dwarf'. Dakota Dwarf Gooseberry. This very compact hybrid gooseberry is a recent introduction from North Dakota State University at Fargo. It was planted out as a hedge in 1968.

Ribes oxycanthoides. Northern Gooseberry. This native plant is one of the first to leaf out in the spring and it remains attractive until midsummer. Leaf spot and heavy infestations of spider mites, especially during dry weather, detract from its appearance. It grew to 4 ft (1.2 m) and was maintained as a clipped hedge for 15 years.

Rosa cinnamomea plena. Cinnamon Rose. This hardy rose makes a dense informal thicket clothed with double mauve pink flowers in July. It grows to 5 ft (1.5 m) and is 3 ft (0.9 m) wide at the base. Remove old wood in July every second or third year.

Rosa 'Prairie Youth'. Prairie Youth Rose. This vigorous shrub rose, developed at Morden and introduced in 1946, makes a tall, 6-ft (1.8-m), informal hedge bearing a profusion of double, salmon pink flowers in early July. To keep the hedge within bounds and to ensure healthy growth, cut out old wood to the ground level in midsummer.

Rosa rubrifolia. Redleaf Rose. For several years this hedge was thrifty and most attractive. It endures drought and is easy to manage as an informal hedge. It is, however, highly susceptible to a disease known as witches'-broom, which killed it.

Rosa spinosissima. Scotch Rose. This hardy shrub rose (Figure 1) made a useful informal hedge 4 ft (1.2 m) high and 2 ft (0.6 m) wide. The plants were kept vigorous by pruning out old wood every second year, immediately after the plants had finished blooming. Because of its prolific suckering, the hedge was discarded.

Rosa spinosissima altaica. Altai Rose. For a number of years this hardy rose made an attractive informal hedge, showy in bloom and handsome in fruit. Every third year the old wood had to be removed. After 15 years, when it had reached a height of 6 ft (1.8 m), it was replaced with 'Prairie Youth'.

Salix alba 'Chermesina'. Redstem Willow. This willow is not so hardy as the golden form and it is not so graceful but, if given the same pruning as the golden willow, its winter bark is fiery red.

Salix alba 'Vitellina'. Golden Willow. The golden willow hedge is coppiced each spring to produce young shoots that are esteemed for their colorful winter bark. When cut back in this manner they make graceful summer hedges and provide useful withes.

Salix pentandra. Laurel Willow. The laurel willow may be treated in the same manner as the redstem and golden willows. It is more vigorous, growing to 9 ft (2.7 m) in a single year. It has large, broad, dark green, very glossy leaves and its winter bark is vivid green.

Salix purpurea. Purple Osier Willow. This willow was first grown as a trimmed hedge, for 10 years. Then it was coppiced to ground level each spring in late April and the plants were allowed to grow naturally. Both methods of culture are satisfactory but the second is preferred at Morden. The hedge was replaced in 1958.

Salix purpurea 'Gracilis'. Slender Purple Osier Willow. This graceful willow makes a charming, informal hedge when cut down to ground level each spring. The young growths reach a height of 5 or 6 ft (1.5 or 1.8 m) and make useful garden stakes.

Shepherdia argentea. Buffaloberry. The native buffaloberry makes a dense, spiny hedge that can be kept at a height of 6 ft (1.8 m) for many years. It has small, gray foliage and twiggy growths that stand close clipping very well. It does well in shade and saline soils. After 30 years, the hedge at Morden is in fairly good condition. It was replanted in 1970.

Spirea arguta. Garland Spirea. The garland spirea is a little hardier than the better-known Vanhoutte spirea. It makes a graceful hedge when the old wood is cut out every third year immediately after the plants have bloomed. When plants have suffered winter injury, which happens occasionally, they are hard pruned in April. The bloom is sacrificed for that year but the plants become vigorous again. The hedge at Morden, 5 ft (1.5 m) high and 3 ft (0.9 m) wide, is 30 years old.

Spirea trichocarpa 'Density'. Density Spirea. This dwarf mutation of the Korean spirea originated at the Forest Nursery Station, Indian Head, Sask. It was planted in 1956 and may be useful as a dwarf hedge.

Spirea trilobata. Three-lobed Spirea. This species is hardier and dwarfer than either the garland or Vanhoutte spirea and better for use as a clipped hedge. The specimen at Morden, established for 4 years, is 1½ ft (0.45 m) high and 9 in. (23 cm) at the base. It is recommended as a dwarf, compact, hardy hedge.

Spirea vanhouttei. Vanhoutte Spirea. When given the treatment recommended for the garland spirea, Vanhoutte makes a choice flowering hedge. Its foliage is small, roundish, more attractive than that of the garland, and colorful in autumn. It is not hardy on most of the prairies and other

species should be used in its place.

Symphoricarpos occidentalis. Western Snowberry. This native plant made a fairly dense hedge that was kept closely trimmed to a height of 3 ft (0.9 m). It became a nuisance because of its many suckers. Sucker growths were found 10 ft (3.0 m) from the hedge in surrounding grass areas.

Syringa amurensis. Amur Lilac. This upright, nonsuckering lilac makes a good tall hedge. It was planted in 1931 and is 9 ft (2.7 m) high and 4 ft (1.2 m) wide. It should be trimmed with pruners or a knife, so that the large handsome leaves are not mutilated.

Syringa josikaea. Hungarian Lilac. This species makes a splendid tall hedge. It has handsome, large, dark green, glossy leaves. When trimmed with pruners its appearance is much improved. It does not sucker, is hardy and long-lived, and can be kept at a height of 5 ft (1.5 m) for many years.

Syringa meyeri. Meyer Lilac. This dwarf small-leaved lilac sometimes wrongly referred to as 'Palibiniana' should make a very good medium sized hedge. It was planted out as a hedge in 1970 at Morden.

Syringa vulgaris. Common Lilac. The common lilac has been planted as a hedge throughout the prairie region. It is hardy, tolerant of drought, free of pests and disease. Its handsome, dark green leaves remain on the plants until late autumn, often well into November. It has a bad suckering habit, and unless unwanted shoots are regularly chopped out the hedge will become much too wide. The common lilac hedge at Morden has been clipped once a year in late June. Occasional flower trusses on the tips of the branches have added to its beauty. Set out in 1931, the hedge became 10 ft (3.0 m) high and 5 ft (1.5 m) wide at the base, but in October 1960 it was trimmed to 3 ft (0.9 m) high and 1½ ft (0.45 m) wide at the base (Figure 3).

Tamarix pentandra. Five-stamen Tamarisk. This hedge was replaced with the Amur form, which is much hardier and better adapted.

Tamarix pentandra amurensis. Amur Tamarisk. This is the hardiest form of tamarisk. It grows 10 ft (3.0 m) high and only occasionally suffers from winter injury. Its light green, feathery foliage and, in midsummer, its plummy, pink flowers combine to make a charming hedge. Hard pruning is recommended in late April. When this is done, no further pruning is necessary. A hedge at Morden is 5 ft (1.5 m) high and 1½ ft (0.45 m) wide at the base.

Thuja occidentalis. Eastern White Cedar. This was kept as a closely clipped hedge. Its appearance was never attractive and it deteriorated rapidly until, after 10 years, it was a poor, rusty-looking hedge.

Thuja occidentalis 'Aurea'. Bushgold Cedar. This golden form, set out in 1956, is 3 ft (0.9 m) high, and 2 ft (0.6 m) wide and not an attractive hedge. The golden leaves are poorly displayed on a trimmed hedge and present a dirty appearance.



Figure 9 — Pyramidal cedar needs little attention if planted in a northeastern exposure.

Thuja occidentalis 'Brandon Pyramidal'. Pyramidal Cedar. The natural habit of this variety lends itself admirably to hedge making (Figure 9); it needs only an occasional pruning. It is 12 ft (3.7 m) high, 3 ft (0.9 m) wide and was damaged by wet snow in 1971.

Thuja occidentalis 'Ellwangeriana'. Ellwanger Cedar. This cedar with fine foliage and blue green coloring is making an attractive hedge. It is 2½ ft (0.76 m) high and 2½ ft (0.76 m) wide and was set out in 1955.

Thuja occidentalis 'Hoveyi'. Hovey Cedar. This upright cedar with bright green foliage made a good evergreen hedge until severely damaged by lack of snow cover followed by un-

usually high temperatures of 92° and 93° in April 1952. Complete sections of the hedge died out.

Thuja occidentalis (Lake St. John). This selected native form from Lake St. John region in Quebec is of dense, upright growth and has medium green foliage. Planted in 1946, it has been kept as a closely clipped hedge and is now 3½ ft (1.0 m) high.

Thuja occidentalis 'Umbraculifera'. Umbrella Cedar. This variety did not thrive and was removed in 1946.

Thuja occidentalis 'Woodwardii'. Woodward Cedar. This variety became unthrifty and was removed in 1946.

Tilia cordata. Small-leaved European Linden. A Swedish form of this basswood stands pruning remarkably well. It was set out as a hedge in 1946, and has been kept at a height of 3½ ft (1.0 m). The foliage is bright green and free of pests and disease. The winter bark is a tawny red.

Ulmus americana. American Elm. Seedling stock of the native elm, set out in 1931, grew 11 ft (3.4 m) high and made a hardy, handsome screen. The hedge was cut back to a height of 2 ft (0.6 m) in 1958. The main stems, which were about 4 in. (10 cm) in diameter, were sawn out in November and the smaller branches left intact until the following April (Figure 10). The plants made splendid recovery, and by the end of the 1959 season they presented a neat and attractive hedge 3½ ft (1.0 m) high and 2 ft (0.6 m) wide, and by 1971 it was a good hedge 7 ft (2.1 m) high.

Figure 10 — A hedge of American elm, which had reached a height of 11 ft (3.4 m) before it was cut back to 2½ ft (0.8 m). The pictures show, left, size of stumps and, right, recovery after one season's growth.



In favorable locations it will make an excellent untrimmed hedge 8 ft (2.4 m) high. It is attractive because of colored foliage in spring and autumn, flowers in June and fruit in autumn and winter.

Ulmus pumila. Siberian Elm. The hardy Manchurian strain of the Siberian elm replaced an earlier and less hardy hedge of this species. It is small-leaved, rapid-growing, and especially recommended where a tall barrier is needed. It has grown more than 3 ft (0.9 m) a year. The specimen hedge at Morden was set out in 1946 and reached a height of 15 ft (4.6 m) before it was cut down to 2 ft (0.6 m). Many trunks were 4 in. (10 cm) in diameter at that time. It made a vigorous, compact and attractive hedge for several years but is now 12 ft (3.7 m) high and breaking open.

Viburnum rafinesquianum. Arrowwood. This native North American plant makes a useful hardy hedge. It can be close-clipped to a height of 6 ft (1.8 m) and kept in good condition for many years without hard pruning. The arrowwood hedge at Morden, planted in 1931, is 5 ft (1.5 m) high, 4 ft (1.2 m) wide, and still dense.

Viburnum trilobum. High Bush-cranberry. This native shrub, set out in 1956, was 2 ft (0.6 m) high and 1 ft (0.3 m) wide at the base in 1962. It has since been removed. The cranberry bush will grow in shade but it is not drought tolerant.

RECOMMENDED VARIETIES

The following are listed in order of preference and availability.

DWARF HEDGES

(up to 2 ft) (0.6 m)

Pygmy caragana

Alpine currant

Bush cinquefoils

Dwarf euonymus

Short-leaved caragana

Clavey's dwarf honeysuckle

MEDIUM-LOW HEDGES

(2 to 3 ft) (0.6 to 0.9 m)

Sweetberry honeysuckle

Cherry prinsepia

Three-lobed spirea

Winged euonymus

Shrub roses

Shubert chokecherry

Arrowwood

American hazel

TALL HEDGES

(over 5 ft) (1.5 m)

Lilacs

Amur maple

Siberian elm

Bur oak

Siberian crabapple

American elm

Green ash

Common caragana

Siberian larch

Ussurian pear

Saskatoon

Globe caragana
Hedge cotoneaster
Siberian currant
Sakhalin honeysuckle
Turkestan euonymus

MEDIUM-TALL HEDGES

(3 to 5 ft) (0.9 to 1.5 m)
Willows (coppiced)
Hawthorns
Buffaloberry
High bush-cranberry

EVERGREEN HEDGES

White spruce
Colorado spruce
Swiss mountain pine
St. John's Lake cedar
Brandon pyramidal cedar
Balsam fir
Rocky mountain juniper
Scotch pine
Red pine
Swiss stone pine

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Hawthorn, Fireberry_____	<i>Crataegus chrysocarpa</i> _____	18
Hawthorn, Fleshy_____	<i>Crataegus succulenta</i> _____	19
Hawthorn, River_____	<i>Crataegus rivularis</i> _____	19
Hawthorn, Toba_____	<i>Crataegus mordenensis</i> 'Toba' _____	19
Hazelnut, American_____	<i>Corylus americana</i> _____	18
Honeysuckle, Clavey's Dwarf_____	<i>Lonicera xylosteoides</i> 'Clavey's Dwarf' _____	22
Honeysuckle, Manchurian_____	<i>Lonicera ruprechtiana</i> _____	21
Honeysuckle, Morrow_____	<i>Lonicera morrowii</i> _____	21
Honeysuckle, Sakhalin_____	<i>Lonicera maximowiczii</i> <i>sachalinensis</i> _____	21
Honeysuckle, Sweetberry_____	<i>Lonicera coerulea edulis</i> _____	21
Honeysuckle, Tatarian_____	<i>Lonicera tatarica</i> _____	21
Juniper, Needle_____	<i>Juniperus rigida</i> _____	20
Juniper, Rocky Mountain_____	<i>Juniperus scopulorum</i> _____	20
Larch, Siberian_____	<i>Larix sibirica</i> _____	21
Lilac, Amur_____	<i>Syringa amurensis</i> _____	29
Lilac, Common_____	<i>Syringa vulgaris</i> _____	29
Lilac, Hungarian_____	<i>Syringa josikaea</i> _____	29

COMMON NAME	SCIENTIFIC NAME	PAGE
Lilac, Meyer_____	<i>Syringa meyeri</i> _____	29
Linden, Small-leaved European____	<i>Tilia cordata</i> _____	31
Maple, Amur_____	<i>Acer ginnala</i> _____	16
Mockorange, Audrey_____	<i>Philadelphus 'Audrey'</i> _____	22
Mockorange, Lemoine_____	<i>Philadelphus lemoinei</i> _____	22
Oak, Bur_____	<i>Quercus macrocarpa</i> _____	25
Oak, Mongolian_____	<i>Quercus mongolica</i> _____	26
Olive, Russian_____	<i>Elaeagnus angustifolia</i> _____	19
Pear, Ussurian_____	<i>Pyrus ussuriensis</i> _____	25
Pine, Dwarf Swiss Mountain____	<i>Pinus mugo pumilio</i> _____	23
Pine, Lodgepole_____	<i>Pinus contorta latifolia</i> _____	23
Pine, Red_____	<i>Pinus resinosa</i> _____	23
Pine, Scotch_____	<i>Pinus sylvestris</i> _____	24
Pine, Swiss Mountain_____	<i>Pinus mugo</i> _____	23
Pine, Swiss Stone_____	<i>Pinus cembra</i> _____	23
Plum, Canada_____	<i>Prunus nigra</i> _____	25
Prinsepia, Cherry_____	<i>Prinsepia sinensis</i> _____	24
Prinsepia, Hedge_____	<i>Prinsepia uniflora</i> _____	24
Privet, Common_____	<i>Ligustrum vulgare</i> _____	21
Rose, Altai_____	<i>Rosa spinosissima altaica</i> _____	27
Rose, Cinnamon_____	<i>Rosa cinnamomea plena</i> _____	27
Rose, Prairie Youth_____	<i>Rosa 'Prairie Youth'</i> _____	27
Rose, Redleaf_____	<i>Rosa rubrifolia</i> _____	27
Rose, Scotch_____	<i>Rosa spinosissima</i> _____	27
Saltbush_____	<i>Halimodendron</i> <i>halodendron</i> _____	20
Sandcherry, Purpleleaf_____	<i>Prunus cistena</i> _____	24
Saskatoon_____	<i>Amelanchier alnifolia</i> _____	17
Snowberry, Western_____	<i>Symphoricarpos occidentalis</i> ____	29
Spirea, Density_____	<i>Spiraea trichocarpa</i> 'Density'_____	28
Spirea, Garland_____	<i>Spiraea arguta</i> _____	28
Spirea, Three-lobed_____	<i>Spiraea trilobata</i> _____	28
Spirea, Vanhoutte_____	<i>Spiraea vanhouttei</i> _____	28
Spruce, Colorado_____	<i>Picea pungens</i> _____	22
Spruce, Colorado Blue_____	<i>Picea pungens glauca</i> _____	23
Spruce, White_____	<i>Picea glauca</i> _____	22
Sumac, Skunkbush_____	<i>Rhus trilobata</i> _____	26
Tamarack_____	<i>Larix laricina</i> _____	21
Tamarisk, Amur_____	<i>Tamarix pentandra</i> <i>amurensis</i> _____	29
Tamarisk, Five-stamen_____	<i>Tamarix pentandra</i> _____	29
Willow, Golden_____	<i>Salix alba 'Vitellina'</i> _____	27
Willow, Laurel_____	<i>Salix pentandra</i> _____	28
Willow, Purple Osier_____	<i>Salix purpurea</i> _____	28
Willow, Redstem_____	<i>Salix alba 'Chermesina'</i> _____	27
Willow, Slender Purple Osier____	<i>Salix purpurea 'Gracilis'</i> _____	28

METRIC EQUIVALENTS

LENGTH

inch	= 2.54 cm	millimetre	= 0.039 in.
foot	= 0.3048 m	centimetre	= 0.394 in.
yard	= 0.914 m	decimetre	= 3.937 in.
mile	= 1.609 km	metre	= 3.28 ft
		kilometre	= 0.621 mile

AREA

square inch	= 6.452 cm ²	cm ²	= 0.155 sq in.
square foot	= 0.093 m ²	m ²	= 1.196 sq yd
square yard	= 0.836 m ²	km ²	= 0.386 sq mile
square mile	= 2.59 km ²	ha	= 2.471 ac
acre	= 0.405 ha		

VOLUME (DRY)

cubic inch	= 16.387 cm ³	cm ³	= 0.061 cu in.
cubic foot	= 0.028 m ³	m ³	= 31.338 cu ft
cubic yard	= 0.765 m ³	hectolitre	= 2.8 bu
bushel	= 36.368 litres	m ³	= 1.308 cu yd
board foot	= 0.0024 m ³		

VOLUME (LIQUID)

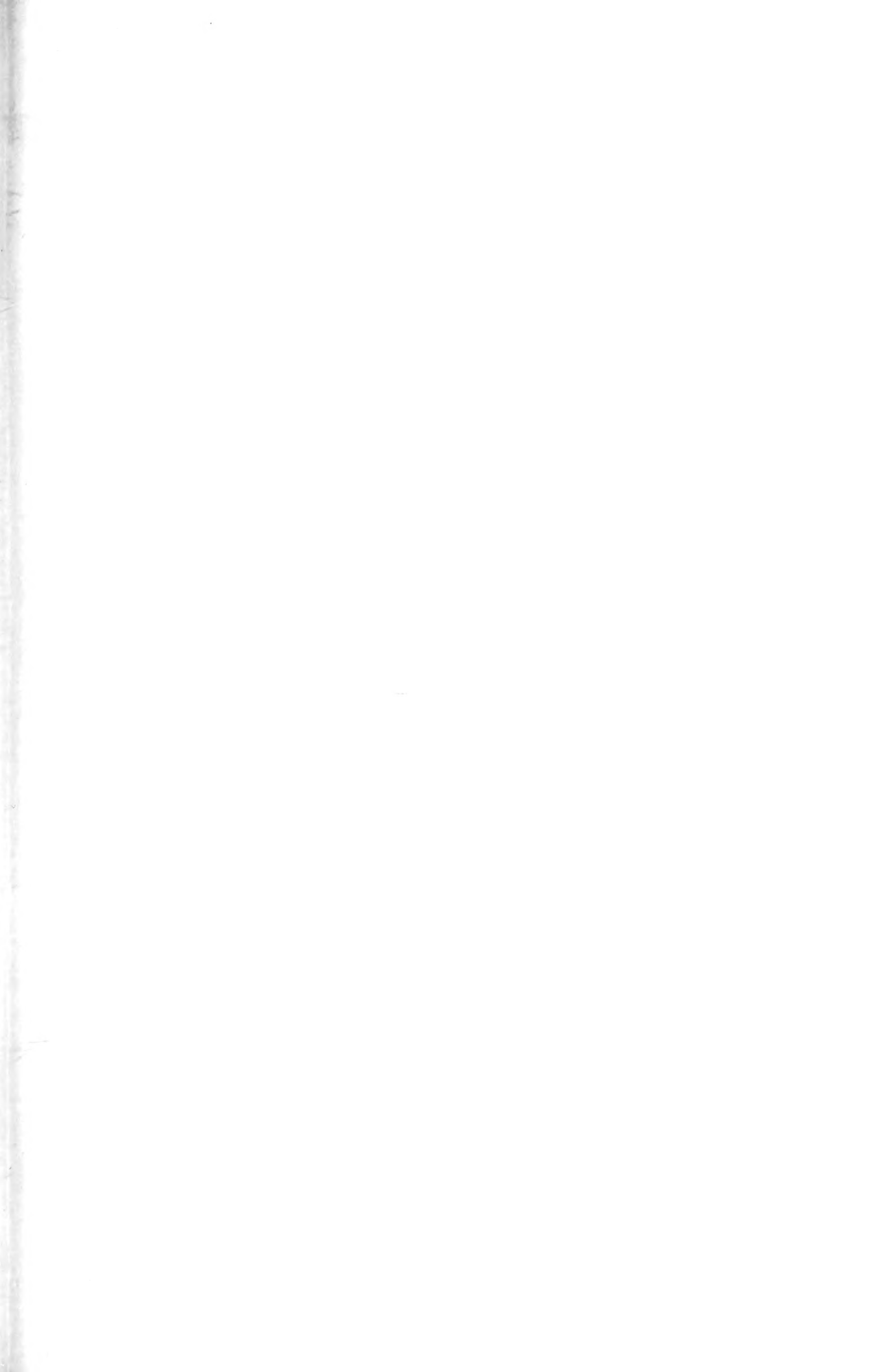
fluid ounce (Imp)	= 28.412 ml	litre	= 35.2 fluid oz
pint	= 0.568 litre	hectolitre	= 26.418 gal
gallon	= 4.546 litres		

WEIGHT


ounce	= 28.349 g	gram	= 0.035 oz avdp
pound	= 453.592 g	kilogram	= 2.205 lb avdp
hundredweight (Imp)	= 45.359 kg	tonne	= 1.102 short ton
ton	= 0.907 tonne		

PROPORTION

1 gal/acre	= 11.232 litres/ha	1 litre/ha	= 14.24 fluid oz/acre
1 lb/acre	= 1.120 kg/ha	1 kg/ha	= 14.5 oz avdp/acre
1 lb/sq in.	= 0.0702 kg/cm ²	1 kg/cm ²	= 14.227 lb/sq in.
1 bu/acre	= 0.898 hl/ha	1 hl/ha	= 1.112 bu/acre



INFORMATION
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IF UNDELIVERED, RETURN TO SENDER EN CAS DE NON-LIVRAISON, RETOURNER À L'EXPÉDITEUR